

WHAT IS CLAIMED IS:

1. An electric potential sensor comprising:
a detecting electrode, the detecting electrode being
to be placed facing a measurement object whose electric
5 potential is to be measured;

an electrically-conductive movable shutter, the
electrically-conductive movable shutter being disposed
so as to be movably located in a spacing formed between
the detecting electrode and the measurement object when
10 the detecting electrode is placed facing the measurement
object, so that an exposure degree of the detecting
electrode against the measurement object can be
controlled; and

a driving unit for driving the
15 electrically-conductive movable shutter, the driving unit
including a current injecting unit for selectively
injecting current into the electrically-conductive
movable shutter.

20 2. An electric potential sensor according to claim
1, wherein the driving unit includes a magnetic-field
applying unit for applying a magnetic field to the
electrically-conductive movable shutter in a direction
approximately perpendicular to a direction of the current
25 injection and a moving direction of the
electrically-conductive movable shutter.

3. An electric potential sensor according to claim 2, wherein the magnetic-field applying unit is a permanent magnet, or an electromagnetic coil.

5 4. An electric potential sensor according to claim 1, wherein at least two electrically-conductive movable shutters and at least two current injecting units are provided, and the electrically-conductive movable shutters are movable owing to interaction between currents
10 which are injected into the electrically-conductive movable shutters in directions approximately perpendicular to moving directions of the electrically-conductive movable shutters by the current injecting units, respectively.

15 5. An electric potential sensor according to claim 1, wherein the electrically-conductive movable shutter is shaped into an electrically-conductive movable shutter which is elastically supported movably.

20 6. An electric potential sensor according to claim 5, wherein a structure of the electric potential sensor is constructed such that a driving frequency of the electric potential sensor can be approximately equalized with a
25 mechanical resonance frequency of the electrically-conductive movable shutter.

7. An electric potential sensor according to claim
1, wherein there are arranged first and second detecting
electrodes which are to be placed facing the measurement
object, and a differential processing unit for
5 differentially processing outputs supplied from the first
and second detecting electrodes, the
electrically-conductive movable shutter can selectively
take a first state or a second state, the first detecting
electrode is exposed to the measurement object more at
10 the time when the electrically-conductive movable shutter
takes the first state than at the time when the
electrically-conductive movable shutter takes the second
state, and the second detecting electrode is exposed to
the measurement object less at the time when the
15 electrically-conductive movable shutter takes the first
state than at the time when the electrically-conductive
movable shutter takes the second state.

8. An electric potential sensor according to claim
20 1, wherein the current injecting unit is a current injecting
unit for injecting current into the
electrically-conductive movable shutter in a direction
approximately perpendicular to a moving direction of the
electrically-conductive movable shutter.

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9. An image forming apparatus comprising:
an electric potential sensor recited in claim 1; and

an image forming unit for controlling image formation
based on an output of the electric potential sensor.

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